



SS – 684

V Semester B.C.A. Degree Examination, Nov./Dec. 2018  
(CBCS) (F + R)  
(2016-17 and Onwards)  
COMPUTER SCIENCE  
BCA-503 : Computer Architecture

Time : 3 Hours

Max. Marks : 100

**Instruction :** Answer all Sections.

SECTION – A

- I. Answer any ten questions : (10×2=20)
- 1) Explain Full adder.
  - 2) Define universal gates with logic circuit.
  - 3) Explain BSA instruction.
  - 4) State De-Morgan's theorem.
  - 5) Define Flip-Flop.
  - 6) Why we use shift register ?
  - 7) Explain Hamming code ?
  - 8) Define Indirect Address Mode.
  - 9) What is meant by Memory-Mapped I/O ?
  - 10) Define virtual memory.
  - 11) What is Parity bit ?
  - 12) Define types of RAM.

SECTION – B

- II. Answer any five questions : (5×5=25)
- 13) Explain the steps involved in design of combinational circuit.
  - 14) Write a note on program counter and stack memory.
  - 15) What is a Karnaugh Map ? Explain different types of Karnaugh Maps.
  - 16) Explain any five register reference instructions.

P.T.O.



- 17) Write a note on Cache memory.
- 18) Compare CISC and RISC processors.
- 19) What are the Important characteristics of memory ?
- 20) Explain timing signals.

Max Marks : 100

## SECTION - C

Time : 3 Hours

III. Answer **any three** questions. Each question carries **fifteen** marks. (3×15=45)

- 21) Explain the types of program interrupts. 10
- 22) a) Simplify  $F(A, B, C, D) = \sum m(1, 2, 4, 6, 8, 10, 12, 14)$  and draw a circuit diagram. 10
- b) What is a parity Bit ? Explain in brief. 5
- 23) Explain types of CPU organization. 5
- 24) a) Explain I/O commands. 6
- b) Explain common BUS organization of a Basic computer. 9
- 25) a) Explain Memory hierarchy. 6
- b) Explain different Addressing Modes. 9

## SECTION - D

IV. Answer **any two** questions. (1×10=10)

- 26) a) Explain direct Address and Indirect Address Modes. 5
- b) Explain the working of R-S flip-flop. 5
- 27) a) Explain 8 to 3 Encoder. 5
- b) Discuss error detection and correction codes. 5

## SECTION - B

(2×5=10)

II. Answer any five questions :

- 13) Explain the steps involved in design of combinational circuit.
- 14) Write a note on program counter and stack memory.
- 15) What is a Karnaugh Map ? Explain different types of Karnaugh Maps.
- 16) Explain any five register reference instructions.

R.T.O.



SN – 664

V Semester B.C.A. Degree Examination, Nov./Dec. 2017  
(CBCS) (F + R) (2016-17 and Onwards)  
BCA 503 : COMPUTER ARCHITECTURE

Time : 3 Hours

Max. Marks : 100

**Instruction:** Answer all Sections.

SECTION – A

- I. Answer **any ten** questions. **Each** carries **two** marks. **(10×2=20)**
- 1) Write the symbol, logical expression and truth table of NAND gate.
  - 2) Give the classification of integrated circuits.
  - 3) Distinguish between RAM and ROM.
  - 4) Define Multiplexer and Demultiplexer.
  - 5) What are the types of binary codes ?
  - 6) Subtract  $24_{(10)}$  from  $13_{(10)}$  using 2's complement method.
  - 7) Define opcode and operand.
  - 8) What is BUN instruction ?
  - 9) What are the two types of computer architecture based on registers ?
  - 10) What are the different types of interrupts ?
  - 11) Define access time and transfer rate.
  - 12) Define Baud rate.

SECTION – B

- II. Answer **any five** questions. **Each** question carries **five** marks. **(5×5=25)**
- 13) Explain the steps involved in the design of the sequential circuits.
  - 14) Explain synchronous binary counter with logic diagram.
  - 15) Discuss on error detection and correction codes briefly.
  - 16) Explain any five register reference instructions.
  - 17) With a block diagram, explain how BSA instruction executes.
  - 18) Explain the addressing modes.
  - 19) Explain DMA controller with a block diagram.
  - 20) Write a note on virtual memory.

P.T.O.



## SECTION – C

III. Answer **any three** questions. **Each** question carries **fifteen** marks. (3×15=45)

- 21) a) Simplify  $F(ABCD) = \sum m(1, 3, 7, 11, 15) + \sum d(0, 2, 5)$  using K-map. 7  
b) What is a half adder ? Design a half adder using only NAND gates. 8
- 22) a) Explain decoder expansion with neat diagram. 7  
b) Discuss the parity generator and parity checker. 8
- 23) a) Explain common bus organization of basic computer with neat diagram. 8  
b) Distinguish between FGI and FGO. 7
- 24) a) What is a sub-routine ? Explain CALL and RETURN instructions. 8  
b) Explain the arithmetic logic shift with a neat diagram. 7
- 25) a) Explain I/O interface unit with a neat diagram. 8  
b) Write a note on isolated vs memory mapped I/O. 7

## SECTION – D

IV. Answer **any one** question. Question carries **ten** marks. (1×10=10)

- 26) a) Explain 4-bit shift register. 5  
b) Explain the working of J-K flip-flop. 5
- 27) a) Explain interrupt cycle with suitable example. 6  
b) List the applications of EEPROM. 4
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V Semester B.C.A. Degree Examination, Nov./Dec. 2016  
(CBCS – Fresh – 2016 – 17 & Onwards)  
BCA – 503 : COMPUTER ARCHITECTURE

Time : 3 Hours

Max. Marks : 100

**Instruction :** Answer *all* Sections.

SECTION – A

- I. Answer **any ten** questions. **Each** carries **two** marks. (10×2=20)
- 1) What is Computer Architecture ? 2
  - 2) State and prove DeMorgan's theorem. 2
  - 3) Mention the different logic families of IC. 2
  - 4) Distinguish between RAM and ROM. 2
  - 5) What is Parity bit ? 2
  - 6) Write the BCD code for decimal number 8745.42<sub>(10)</sub>. 2
  - 7) What are the two types of control organization ? 2
  - 8) Define program counter. 2
  - 9) Mention the major components of CPU. 2
  - 10) What is PSW ? 2
  - 11) What is Polling ? 2
  - 12) What is memory management system ? 2

SECTION – B

- II. Answer **any five** questions. **Each** carries **five** marks. (5×5=25)
- 13) Prove NAND and NOR gates as universal gates. 5
  - 14) Explain PIPO shift Register with a diagram. 5
  - 15) Discuss the Parity generator and Parity checker. 5
  - 16) Explain the operation of interrupt cycle with a flow chart. 5

P.T.O.

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- 17) Explain input-output instructions. 5
- 18) Explain the three types of CPU organization. 5
- 19) Explain the source initiated data transfer using handshaking with a block diagram and timing diagram. 5
- 20) Write a note on memory hierarchy in a computer system. 5

SECTION – C

III. Answer **any three** questions. **Each** carries **fifteen** marks. (3×15=45)

- 21) a) Define K-Map ? Simplify the following Boolean function using K-Map : 8  
$$F(A, B, C, D) = \sum(0, 2, 4, 6, 10, 11, 12, 13, 14, 15)$$
  
b) Explain different binary codes. 7
- 22) a) Define counter. With a neat diagram explain 4-bit synchronous binary counter. 8  
b) Explain octal to binary encoder with diagram. 7
- 23) Explain the design of basic computer with flow chart. 15
- 24) What is addressing mode ? Explain the different types of addressing modes with examples. 15
- 25) a) Explain DMA controller with a block diagram. 7  
b) Explain the working of associative memory. 8

SECTION – D

IV. Answer **any one** question. **Each** carries **ten** marks. (1×10=10)

- 26) a) Explain the working of full adder. 5  
b) Write a note on modes of data transfer. 5
- 27) a) Explain the common bus system. 5  
b) Write a note on RISC and CISC. 5



UN – 323

V Semester B.C.A. Degree Examination, November/December 2015  
(Y2K8 Scheme) (F + R)  
Computer Science  
BCA – 502 : COMPUTER ARCHITECTURE  
(100 – 2013-14 & Onwards) (90 – Prior to 2013-14)

Time : 3 Hours

Max. Marks : 90/100

- Instructions:** 1) Section A, B, C is common to all. Section D is applicable to the students of 2011-12 and Onwards.  
2) 100 marks for students of 2011-12 and onwards. 90 marks for Repeaters prior to 2011-12.

SECTION – A

- I. Answer any ten questions. Each carries two marks. (10×2=20)
- 1) State and prove Demorgan's law.
  - 2) Draw the logic diagram of the Boolean function  $F = AB + A'B$  using NAND gates only.
  - 3) What is Decoder Expansion ?
  - 4) What is unidirectional and bidirectional shift register ?
  - 5) Convert  $(736.4)_8$  to decimal and binary.
  - 6) What is self complementing code and weighted code ?
  - 7) What are the two types of control organization ?
  - 8) How many bits are needed to specify an address for a memory unit of 4096 words ?
  - 9) What is PSW ?
  - 10) What is an external interrupt ? Give an example.
  - 11) What are peripherals ?
  - 12) What is memory management system ?

P.T.O.



## SECTION - B

II. Answer any 4 full questions. Each full question carries 14 marks : (14×4=56)

- 11) Design a combinational logic circuit with 3 input x, y, z and the three output A, B, C. When the binary input 0, 1, 2 or 3, the binary output is one greater than the input ? When the binary input is 4, 5, 6 or 7 the binary output is one less than the input ? 14
- 12) a) List all the unused combinations in BCD, 2421, Excess - 3 and Excess - 3 gray code. (4+10)  
b) Derive a circuit for a 3 bit parity generator and a 4-bit parity checker using an even parity.
- 13) Explain with a neat block diagram how the basic computer registers are connected to a common bus. 14
- 14) a) Explain 3 types of data manipulation instructions. With an example for each. (6+8)  
b) What are addressing modes ? Explain the different types of addressing modes.
- 15) Explain the working of a basic computer with a neat flow chart. 14
- 16) a) Explain the working of a DMA controller with a block diagram. (7+7)  
b) Explain associative memory with a neat block diagram.